Sorghum adapted to Northern European temperate climate, 55° latitude

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Sorghum adapted to Northern European temperate climate, 55° latitude

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Introduction
Sweet sorghum as **dual purpose crop** for biofuel production and feed is attractive due to the fact that it is productive also under reduced-input agriculture. However, it needs to be adapted to the cool climate of North Europe. Several germplasm collection have since 2010 been grown in Denmark and compared to **contrasting climates**.

Field evaluation 2017
Five lines were grown as single rows at two locations. Data for stem **protein**, **sugars** and **fructan**s are shown.

2017	Protein	Sucrose	Fructose	Glucose	Total free	Fructan
Line	Total-N*6.25	g/100 g DW	g /100 g DW	g/100g DW	g/100g DW	g/ 100g DW
CN1	5.2	7.0	1.0	1.1	9.1	nil
CN1-BI	4.5	12.0	2.7	3.8	18.5	0.8
HD12	5.8	11.3	2.0	1.2	14.5	nil
HD19	6.4	11.3	1.7	2.0	14.1	2.3
CN2	5.3	18.1	2.6	5.4	22.6	7.3

Yield trial 2018 (55°40′ N and 12°18′ E, Taastrup, Denmark)
Six contrasting Dutch lines (no. 1-6) were grown in RCBD with 4 replicates, each plot 3 rows (10m). Sown in May and harvested October 15, 2018. In spite of abnormal long, **dry and hot summer**, these sorghum lines all performed well and **produced seeds**.

2018	Line	Heading	Brix-value	PHT	Biomass wet	Biomass dry
No.	2018	Date	(g sugar /100 mL)	cm	g/ 10 olants	g/ 10 plants
1	HD7		7.0	157	3092	552
2	CN1	July 19	8.6	135	1891	420
3	S4		7.5	140	1809	405
4	CN6		8.0	156	3355	622
5	HD19	July 25	6.7	146	3131	599
6	CF	July 11	8.9	140	2110	470

Fact box 1
A **mapping population** of Chinese sorghum was grown in Denmark and China and morphological, biomass and biofuel traits were found with high broad-sense heritability. Using DNA markers significant QTLs were discovered and it was concluded that sweet sorghum with tall plant, fast maturation and high stem Brix content can be bred as a biofuel crop for high altitude climate (Theor Appl Genet 2015).

Fact box 2
A collection of accession from ICRISAT was grown in 2014 and 2015 in Denmark and some lines could accumulate **high amount of sugar** in the stem juice. (Int J Res Agric Forest. 2018). The yield stability and bioenergy potential were also compared between the contrasting temperate and tropical climates of Nigeria (Can J Agri Sci, 2018).